MOTOROLA

May 5, 2003

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Room TW-A325
Washington, DC 20554

Re: Ex Parte, WT Docket No 01-309

Dear Ms. Dortch:

On April 29, 2003, representatives of Motorola met in a joint meeting with members of the Office of Engineering Technology (OET), the Wireless Telecommunications Bureau (WTB), and the Consumer and Governmental Affairs Bureau (CGB) to discuss issues related to the referenced proceeding. Those in attendance at the meeting from the FCC were: Julius Knapp, Rashmi Doshi, David Means and Bill Hurst of OET, Greg Guice and Joe Levin of WTB and Janet Sieffert of CGB. Representatives from Motorola were Mary Brooner, Tim Harr, Steve Hauswirth, Scott Kelley, and Robert Zurek.

Motorola discussed in this meeting its experience in a variety of test scenarios to become familiar with the ANSI C63.19 standard adopted in 2001. Motorola's testing has been conducted both in its own labs and with a limited number of consumers who wear hearing aids. Motorola has also examined 47 CFR 68.316, the wireline hearing aid compatibility standard, to understand better how the wireline telecoil standard might be applied to the wireless environment. Motorola discussed the following conclusions reached in these tests:

1) The U test for RF emissions appears to be workable and may be of use to some consumers. However, the testing of dual-mode handsets in the analog mode is meaningless and penalizes unnecessarily many of those wireless devices that have analog mode.
2) The UT test has significant flaws and should be revamped. It is highly difficult to do meaningfully (the result of low-frequency background noise); it does not help the consumer predict his/her hearing experience; and, based on our limited testing with hearing aid users, there is no correlation between the UT rating and the user experience.
3) Part 68.316 (the telecoil standard for wireline handsets) could be a usable foundation to apply to the wireless environment if further technical work is carried out by the industry to adjust the standard to specify in-put into the cell interface or output of the transducer, and adjustments are added to address air interface audio band limitation.

Motorola explained that its conclusions are based on testing the wireless device portions of the ANSI C63.19 standard only. Motorola has no information about how particular hearing aids test to the hearing device measurements of the standard. Motorola noted that the standard was written as a system standard whereby information from the hearing aid device as well as the wireless handset would be tested and rated for the benefit of the consumer. Motorola explained that much more could be learned about how the system works and what solutions are optimal with the full participation and cooperation of the hearing aid industry.

Motorola, Inc., Global Government Relations
1350 I Street, N.W., Suite 400, Washington, DC 20005 T: (202) 371-6900

MOTOROLA

The RF Emissions Testing (U Standard) in ANSI C63.19

The tests in this portion of the ANSI C63.19 standard are intended to measure RF emissions which have the potential to cause interference to the hearing aid. Motorola recommended that the analog test measurement be eliminated from the U rating. The wireless analog mode has not been shown to cause any real-world interference to hearing aid devices, and Motorola is unaware of any complaints by a hearing aid user receiving RF interference from a handset in the analog mode. However, the ANSI C63.19 RF emissions testing requires analog mode and is set up in such a way that a wireless device in analog mode often receives usability rating lower than in digital mode. For wireless devices that are dual mode, it is Motorola's laboratory experience that the analog test results generally result in a lower rating by at least a full U-category in the usability scale compared to testing in the digital mode only. Since RF interference with hearing aids only occurs when the phone is in the digital mode, digital measurements should be the only requirement. Furthermore, when the analog test measurements are eliminated from the U rating, Motorola's live testing of its handsets with consumers who wear hearing aids does indicate a positive correlation of user experience to the U rating.

The Telecoil Testing (UT standard) in ANSI C63.19

Motorola explained that the UT test suite and rating is intended to help predict the usability of a wireless device in the audio magnetic band (telecoil) mode. Motorola explained that the Signal-to-Noise test in ANSI C63.19 is flawed because it does not make use of typical industry Signal/Noise comparison criteria, and the version of signal to noise in ANSI C63.19 sets unrealistic ambient noise requirements. Specifically, normal levels of environmental background noise, which are incorporated into the UT standard as part of the Signal Quality calculation, can result in phones with noise levels below the noise floor being poorly rated under the standard. As demonstrated in the two attached graphs, "good" devices are punished by a poorly devised specification in the standard.[1] An example of this result is that a landline handset actually fails to achieve good results under the UT test.

In addition, two additional points of concern with the UT test involve: (i) the UT comparison of a narrowband desired Signal to broadband A-weighted Noise signal, and (ii) the Articulation Weighting Factor (AWF) is an additional penalty placed on the wireless device and is unrelated to the noise floor.

Motorola also explained that the most helpful test result for consumer users to predict the hearing experience in the telecoil mode would encompass the magnetic field intensity and frequency response (elements included in the wireline telecoil standard, Part 68.316). While the ANSI C63.19 UT standard identifies tests for field intensity and frequency response, the UT rating does not include them in the rating calculations. Motorola also noted that the ANSI C63.19 response requirements for field intensity and frequency response are 5 dB more stringent than the landline standards.

[1] See Appendix A "Noise Floor Measurements With and Without a Phone" and Appendix B, "Field Intensities and Frequency Responses."

Motorola, Inc., Global Government Relations
1350 I Street, N.W., Suite 400, Washington, DC 20005 T: (202) 371-6900

MOTOROLA

Motorola also advised the FCC that there are tremendous problems in implementing the UT test suite, even assuming the tests in the suite are valid and useful. The key issue is the background noise floor in the ANSI C63.19 UT standard. RF chambers commonly used in industry labs for testing do not have sufficient attenuation at the low frequency levels required for the UT testing. To conduct the tests as intended in the UT standard would require custom E/M attenuation rooms. Furthermore, there are numerous tests – over 80 measurements per handset. The UT test suite calls for 16 measurements for 5 sets of measurements for each handset. Motorola reported that in its experience in its labs, it takes approximately 3 hours to conduct the full suite of tests identified in the UT standard, yet when the rating calculations are plugged in, not all of the measurements are used.

Based on Motorola's experience with the test suite for the ANSI UT standard in its audio labs, Motorola recommended that the FCC not require use of this standard because serious revamping is still required. Motorola also identified some areas of research that may be fruitful for review. Areas to explore include an analysis of the weighted averaging requirements, and whether a frequency-to-frequency signal to noise approach may be more useful. In addition, Motorola suggested that the wireline telecoil standard could be a usable foundation for the wireless environment with additional technical work as specified in 3) above.

Lastly, Bob Zurek, a Motorolan who participated in this *ex parte* meeting, recently made a presentation on the ANSI C63.19 standard at the international meeting of the Audio Engineering Society. His presentation, "Handset Testing to the New Standards for Hearing Aid Interface" explores in greater technical detail the issues presented to the FCC in this *ex parte*. We are attaching his slide presentation as Appendix C.

Respectfully submitted,

/s/

Mary E. Brooner
Director, Telecommunications Regulation & Strategy
Global Government Relations Office
Motorola, Inc.

Attachments:
Appendix A
Appendix B
Appendix C

Cc:
Julius Knapp, OET
Rashmi Doshi, OET
David Means, OET
Bill Hurst, OET
Greg Guice, WTB
Joe Levin, WTB
Janet Sieffert, CGB